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CRITICAL PROBLEMS IN ECONOMIC STATISTICS

Reports on selected critical problems in economic statistics

Note by the Secretary-General

The Secretary-General has the honour to transmit to the Statistical Commission reports on eight critical problems identified by the Expert Group on Critical Problems in Economic Statistics. The reports were prepared by various authors in accordance with a request of the Statistical Commission at its twenty-eighth session,[1] and they are transmitted in accordance with a request of the Commission's Working Group on International Statistical Programmes and Coordination at its eighteenth session (E/CN.3/1997/19, para. 23).

Sections I and II of the present report contain two comprehensive information appears on the issues of globalization and economics of intangibles, which were prepared by the national statistical offices of Canada and of the United Kingdom of Great Britain and Northern Ireland, respectively. In sections III, IV and V, three existing informal consultation groups - the Voorburg Group, the London Group and the Ottawa Group - report on their work on the quality of labour, resource accounting and the measurement of price change. The Working Group had encouraged countries to address additional critical issues within a similar framework in so-called Voorburg-type groups. Accordingly, sections VI, VII and VIII describe the proposals of the Australian Bureau of Statistics, the Department of Statistics India and the Institut national de la statistique et des études économiques of France for forming three such informal consultation groups to pursue work in the areas of capital, informal sector statistics, and labour and compensation, respectively. Section IX contains points for discussion.

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Proposed terms of reference for an evaluation of the International Comparison Programme are contained in an addendum (E/CN.3/1997/3/Add.1, annex).

Notes

[1] See Official Records of the Economic and Social Council, 1995, Supplement No. 8 (E/1995/28), chap. XVI.

Annex

REPORTS ON SELECTED CRITICAL PROBLEMS IN ECONOMIC STATISTICS

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INTRODUCTION

1. The Expert Group on Critical Problems in Economic Statistics has identified 14 issues in its report (see E/CN.3/1997/2). Subsequently, the Working Group on International Statistical Programmes and Coordination requested contributions on 11 of those issues for submission to the Statistical Commission at its twenty-ninth session (see E/CN.3/1997/2, table). Eight of those critical issues are covered below; in addition, the International Comparison Programme (ICP) is covered in an addendum (E/CN.3/1997/3, Add.1). With regard to the proposed draft code of best practice for the topics "Good behaviour" and "Effective communication with stakeholders", the Czech Republic has recently signalled its preparedness to convene a meeting on this issue provided that a sufficient number of countries participate. A progress report on devolution and deregulation has not been prepared because no country has taken the lead on that issue to date; the United Nations Statistics Division continues to seek a Convener.

I. GLOBALIZATION

2. The present section on globalization (see E/CN.3/1997/2, sect. III.F) is based on a paper entitled "Statistics Canada's globalization initiative", which was prepared by Mr. J. McMechan and Mr. J. Ryten of Statistics Canada in October 1996.

A. Introduction

3. The term "globalization" here indicates a process in which businesses seek, in an ongoing fashion, the most favourable venues in which to locate their operations or parts of operations, irrespective of whether the locations selected are in the same country or in different countries, and are prepared to change locations even in the short run in response to changes in relative prices.

4. The statistical challenge presented by globalization also implies tracking down in a systematic way how all the parts of a business fit together, even if they are located in different countries, and ensuring that when comparisons are made among globalized and non-globalized business, due account is taken of intra-business transborder flows of goods, services and capital.

5. Statistics Canada's globalization initiative was designed to meet that challenge, starting with the information required to understand how the various parts of a given firm fit together; establish which of its parts are located in Canada; deduce behaviour related to its condition; and relate the firm's performance to its new form of organization.

6. The present section describes the experience of Statistics Canada in this area: what it has done to date to meet the challenge and what is still missing.[a] Points for discussion are:

(a) If we agree on the general description of the process, do we also agree on what is missing from our data sets so as to produce useful statistics on it?

(b) What suggestions may be made for putting together a long-term agenda for statistical work on globalization, recognizing that there are legal and technical barriers that stand in the way?

(c) What role can international organizations play in the task of putting together information collected from different political jurisdictions?

B. Current trends

7. In the past two decades, the process of globalization has become widespread. Firms have scattered the activities that are part of their production processes over many countries, and have integrated them globally. In order to do so they have found the location at which each part of production can be carried out most efficiently, and are prepared to change locations as soon as efficiency can be improved by moving elsewhere.

8. As an example, consider a Canadian-owned firm in a pre-globalization world. The management activities necessary to run the firm are carried out in Canada. Assume it is a manufacturing firm, with its plant also located in Canada. A distribution centre is located in Canada, as well as a company-owned trucking fleet assigned with the task of carrying the company's products and goods to market.

9. Consider now the following examples of changes possible in a globalized world. Assume there has been a buy-out by a holding company located in the United Kingdom of Great Britain and Northern Ireland, and that the head office has been moved to the United Kingdom together with all management activities carried on at the head office, in close proximity to the new owners. The manufacturing activity continues to be carried out in the same plant in Canada for reasons related to the availability of raw materials and a good quality labour force. However, in recognition of the need to better serve the entire North American market with the products manufactured by the plant, the distribution centre has been moved to the United States of America so as to be closer to the United States and Mexican markets. It remains under Canadian management and ownership but is incorporated in the United States. The trucking fleet continues to be owned and located in Canada since it transports the product throughout North America.

C. What has led to the new situation

10. When firms operate in production networks that span a number of countries, they make decisions on where to locate the various functions that are part of their production process, based on where those functions can be performed most efficiently. Thus, manufacturing, distribution, trucking and corporate head office activities, which were once co-located in one place, end up being located in different countries.

11. Several ongoing developments have made it possible for firms to operate in this manner, including:

(a) Reductions in trade and investment barriers. Firms can make the best economic decisions about where and how to operate without taking into consideration political barriers against trade and investment;

(b) Changing transportation and communication technologies. The improvements in transportation and communications shorten the distances and lower the costs of transfer between the constituent parts of a production network;

(c) The rapid industrialization of some developing countries. Developing countries can now support sophisticated production facilities and still supply relatively low-priced labour.

D. What information may Governments and business wish to have?

12. The globalization of economic activity has implications for both the firms involved in the process and the Governments of the countries where parts of globalized firms are located. For example, globalization has meant that Canadian firms face increasing competition in the domestic as well as foreign markets from firms located in other countries. From a government point of view, globalization has meant that industrial and trade policies have become increasingly interrelated and their effects more difficult to measure and anticipate. Accordingly, for traditional public policies to maintain their effectiveness in achieving national objectives, the amount of information required to monitor effects has increased enormously.

13. Nor is the search for more information limited to Governments. If businesses are to compare their performance with others operating in the same environment, they need to know how the growth and profitability of a purely domestic firm in terms of ownership and activity compares with a firm that:

(a) Imports inputs to its production process and exports its products;

(b) Has a foreign parent or subsidiary;

(c) Has a foreign parent or subsidiary and carries out trade within this corporate family, that is, operates as part of a global integrated production network.

14. In order to make rational decisions both business and Governments may wish to take into account the following:

(a) The linkages between trade and foreign investment. They may be substitutes - a firm that had previously been producing a good or service in the home country and exporting part of its output has now undertaken investment to set up a producing firm abroad; alternatively, they may be complements - a firm has undertaken investment to establish a wholesale distribution or service facility in a foreign market to better sell the product produced at home;

(b) The consequences of merchandise trade for trade in services. For example, does the need to deliver a physical product to a foreign market imply the provision of transportation or insurance services, and if so, should these be outsourced or part of the global firm's production network?

(c) Are the more successful firms vertically integrating their activities or diversifying horizontally?

(d) Is there a concentration of foreign activities in a relatively small number of firms or is it widespread across firms by industry, location and size?

15. The list of issues for which information is required continues:

(a) Relative to the size of home located industry, how large is globalized industry? That relationship suggests how responsive industry might be to home-based measures;

(b) Is globalized production associated with jobs of equally high quality and stability as those provided by home-based industry?

(c) Is the home part of the production process low or high value-added? What are the consequences for the labour skills required?

(d) Is globalization connected with positive spillover benefits to the home economy, such as the spread of high technology?

16. The traditional way in which businesses were asked to provide information on how they were organized and what they did included two variants. Using the example above, head offices could supply information about the manufacturing, distribution and trucking activities of their operation; alternatively, each constituent part of the firm (the head office, manufacturing plant, distribution centre and trucking office) could be surveyed separately if that was the way for the company to most accurately report the required data. In either case, the structure of the firm, the ownership relationships between the various parts of the firm and the activity data of each part of the firm could be appropriately described. Data reported included production data (revenues and expenses); total employment and wages and salaries; products produced; exports and imports; and data about the head office, including its existence and activities, if any.

17. In order to describe what happens when an enterprise goes global, however, the required information cannot be limited to traditional data. If sense is to be made of what the enterprise makes, consumes and sells, its various components must be tracked irrespective of their location and related to each other, as indeed they are in the real world. Failure to do so leaves components of an enterprise with no apparent economic reason to operate, let alone to do so successfully.

18. Table 1 shows what data are required to provide a full description of a global enterprise using the example given above.

Table 1. Statistical agency data request

Country location	Manufacturing firm activity[a]	Trucking firm activity[b]	Distribution firm activity[c]	Sales and exports of goods[d]	Sales and exports of services[d]	Imports of goods[d]	Imports of services[e]	Head Office activity[e]
	Traditional	Traditional	New	Traditional	Traditional	Traditional	New	New
CANADA	From manufacturing plant located in Canada	From trucking firm located in Canada	**Canada requires the entire firm structure. Requires data from legal firm in USA**	From manufacturing plant located in Canada	Data for transportation service provided by trucking firm	From manufacturing plant located in Canada	**Canada requires Head Office services provided to manufacturing and trucking firms**	**Canada requires identification of Head Office in UK and its activity data as reported in UK**
	New	New	Traditional	Traditional		Traditional	Traditional	New
USA	**Requires this data from Canada in order to relate to distribution firm activity**	**Requires this data from Canada in order to relate to distribution firm activity**	From distribution firm located in USA	From distribution firm (shipments to Canada and Mexico are exports)		From distribution firm (shipments received from manufacturing plant in Canada)	USA requires that Head Office be services provided to distribution firm	**USA requires identification of Head Office in UK and its activity data as reported in UK**
	New	New	New	New	New	New		Traditional
UK	**Requires relationship with Head Office. Requires data from Canada to relate to Head Office activity**	**Requires relationship with Head Office. Requires data from Canada to relate to Head Office activity**	**Requires relationship with Head Office. Requires data from USA to relate to Head Office activity**	**Requires data from Canada to relate to Head Office activity**	**Requires data on Head Office services provided to other parts of firm**	**Requires data from Canada to relate to Head Office activity**		From Head Office located in UK

Source: Statistics Canada.

Note: Key cells have entries in bold type.

[a] At cost plus margin.

[b] With consistent valuation.

[c] With consistent valuation of goods purchased.

[d] At fair market value.

[e] In the North American Industry Classification System (NAICS), head offices are a separate category and not necessarily an ancillary unit.

E. The Statistics Canada initiative

19. The globalization initiative was designed to fill in the key cells (in bold type) in table 1, using available information (see table 2).

20. The interim was to describe behaviour and economic relationships at the level of the firm. The information required was microlevel data on the activities firms, and not data on industry or other types of aggregate data. The required data included the entire cross-border activity of firms, including trade in goods and services; investment, both outbound and inbound; and an indication of the relationship of the firms involved in such activity, such as affiliated firms operating as part of a global production network versus arms-length transactors. That information had to be supplemented with such characteristics as type of economic activity and country of control.

21. Information on those activities and their relationship to each other within one multinational enterprise could be obtained either through an extensive survey or - more efficiently - by the linkage of each firm to its microlevel data arising from different surveys conducted or administrative data gathered by Statistics Canada. The second option was chosen, and the information linked for each firm includes:

Goods trade

Exports by country, commodity and province

Imports by country, commodity and province

Exports and imports by stage of production (for further processing or final goods)

Services trade

Exports by country and category of service

Imports by country and category of service

Data are available on an ad hoc basis

Parent-subsidiary relationship

Canadian direct investment abroad: value and geographic destination (indicating that the firm is a Canadian parent of a foreign subsidiary)

Country of control (indicating that the firm is a subsidiary of a foreign parent)

Parent-subsidiary activity

Affiliation of trading businesses for goods exports and imports

Affiliation of trading businesses for services exports and imports

Table 2. What data Canada now has, based on microlevel linkage of data and relationships

Country location	Manufacturing firm activity[a]	Trucking firm activity[b]	Distribution firm activity[c]	Sales and exports of goods[d]	Sales and exports of services[d]	Imports of goods[d]	Imports of services[e]	Head Office activity[e]
	Traditional	Traditional	New	Traditional	Traditional	Traditional	New	New
CANADA	**From manufacturing plant located in Canada**	**From trucking firm located in Canada**	*Canada requires the entire firm structure. Requires data from legal firm in USA*	**From manufacturing plant located in Canada**	**Data for transportation service provided by trucking firm**	**From manufacturing plant located in Canada**	Canada requires Head Office services provided to manufacturing and trucking firms	*Canada requires identification of Head Office in UK and its activity data as reported in UK*
	New	New	Traditional	Traditional		Traditional	Traditional	New
USA	Requires this data from Canada in order to relate to distribution firm activity	Requires this data from Canada in order to relate to distribution firm activity	From distribution firm located in USA	From distribution firm (shipments to Canada and Mexico are exports)		From distribution firm (shipments received from manufacturing plant in Canada)	USA requires Head Office services provided to distribution firm	USA requires identification of Head Office in UK and its activity data as reported in UK
	New	New	New	New	New	New		Traditional
UK	Requires relationship with Head Office. Requires data from Canada to relate to Head Office activity	Requires relationship with Head Office. Requires data from Canada to relate to Head Office activity	Requires relationship with Head Office. Requires data from USA to relate to Head Office activity	Requires data from Canada to relate to Head Office activity	Requires data on Head Office services provided to other parts of firm	Requires data from Canada to relate to Head Office activity		From Head Office located in UK

Source: Statistics Canada.

Note: Cells with entries in bold type indicate data now available; cells with entries in italics indicate data now partly available.

[a] At cost plus margin.

[b] With consistent valuation.

[c] With consistent valuation of goods purchased.

[d] At fair market value.

[e] In NAICS, head offices are a separate category and not necessarily an ancillary unit.

Industry

Industry code of business

Geographical location

Geographical area of trade for goods and services exports and imports

Provincial designation of the business within Canada (head office and/or operations within each province)

Activity and performance data

Income statement and balance sheet, financial ratios, research and development

22. The resulting database exists for 1990 to 1994, with trade data extending to 1995. It contains the universe of incorporated firms in the Canadian economy. The largest firms (about 35,000) have extensive income statement and balance sheet information. They incorporate almost all of the importing and exporting and foreign-controlled firms. The coverage of international trade-in-services activity is not as complete because those data are collected partly as microlevel data from firms and partly as activity data from other sources. Thus, only a subset of trading firms can be linked to their services trade data.

23. The remainder of the file is made up mostly of firms that do not participate in cross-border activities. For those firms, the information available consists of industry code, provincial location and summary financial information.

F. What is missing?

24. Table 2 indicates data available on the globalization database (in bold type) or data that are partly available (in italics). Activity data are collected from the manufacturing and trucking firms. It is known that they belong to the same corporate family, that their parent firm is in the United Kingdom and that the United States-based firm is a subsidiary of one of the Canadian firms. An approximate industrial code gives a good idea that the United States firm is involved in distribution. However, data on the magnitude of the establishment trade - that is, the economic activity of a subsidiary establishment in another country - as well as data on the head office, are not available.

25. A comparison with pre-globalization data reveals that the firm has spread its operations over several countries. Parts of its activity have remained in Canada but certain types of activity are now carried out elsewhere. While activity data for all parts of the firm were available before globalization, data on establishment trade and information about head office activities are now missing.

26. We know whether the export and import transactions of the manufacturing firm are with related firms, and we know the value of the exports and imports and what commodities are traded. We also know whether exports and imports consist of finished goods or goods at an intermediate stage of fabrication. Accordingly, we can draw conclusions about the role of the manufacturing firm in the larger integrated production process. For example, there may be evidence that the manufacturing firm imports raw materials or semi-fabricated goods and makes final goods, a high value-added activity and one that may require highly skilled employees. Alternatively, we may discover that the Canadian firm operates at an earlier stage of fabrication and does not have responsibility for a high value-added final stage of production. If the trading activities of the Canadian manufacturer are not with a related firm, we will know that it is competing in the market.

27. In the pre-globalized world, information needs were less complex and were more easily met. Although imports and exports were measured, there was no need to interpret such data in terms of their possible role in the various stages of a production process.

28. In terms of services trade after globalization, we know if the provision of the trucking service internationally is to a related firm or an unrelated firm. However, we are not able to record the provision of head office services to the manufacturing and trucking firms. If we do not capture their use of, for example, accounting services provided by the head office, we will not have a true picture of the expenses of the Canadian operations, nor will we see all the interactions between the various parts of the firm.

29. In the pre-globalized world, we did not seek information on the provision of trucking services from one arm of a firm to another, whereas it becomes a key part of the global production network in the new environment. In neither the old nor the new environments did we capture the provision of head office services.

30. Those differences in the situations "before" and "after" are aimed at the firm. At the more aggregate level, policy must be informed of the implications for the domestic economy. Assume that the gross value of production for the firm remained the same before and after. Canada was previously the location of production of the entire value-added related to gross production. After globalization, however, Canada retains only a part of the total value added. Other interesting ratios will change as a result, in both aggregate and individual terms. For example, the ratio of value added to gross value of output will change, and so might measures of productivity.

31. There are other important aspects of globalization that are missing from the database and thus pose limits to the analyses that it can bear. Statistics Canada does not collect comprehensive data on geographical sources of financing on a firm-by-firm basis, and it does not have enough information to detect how globalized firms gain access to capital on a global basis.

32. One issue of particular policy interest concerns innovation and the diffusion of technology. On the one hand, globalization is believed to promote innovation and the rapid diffusion of technology, while on the other, it is the

need to innovate and adopt new technologies that is believed to be the driving force behind globalization. Such opposing propositions can only be tested when the database includes the above-mentioned details on the activity of firms.

G. Conclusion

33. At this stage, a database exists with the linked variables listed in paragraph 22 above. That database will be used to test a list of common assumptions and beliefs about the way in which globalized firms work on the factors that lead to globalization, as well as to determine whether globalized firms are qualitatively different from the home-based variety. But those studies are not yet complete. For the time being, Statistics Canada wishes to mobilize the attention of others and focus on the long-term issue of how to capture missing data.

II. ECONOMICS OF INTANGIBLES

34. The present section on economics of intangibles (see E/CN.3/1997/2, sect. III L) is based on a paper entitled "How should economic statistics respond to information technology", which was prepared by Mr. Henry Neuburger of the Office for National Statistics of the United Kingdom of Great Britain and Northern Ireland.[b]

A. Introduction

35. There is a widespread sense that information technology has transformed the nature of the economy in a way that renders traditional tools of analysis ineffective. For example, a recent article in the Financial Times notes that:

> "A second source of downward bias, emphasized in congressional testimony by Mr. Alan Greenspan, the Federal Reserve Chairman, reflects the failure of statisticians to keep pace with the changing structure of the economy - the progressive substitution of intangible services for physical output. Under existing conventions, a steel mill is treated as capital investment and added to gross domestic product (GDP). Corporate expenditure on computer software, however, is treated as a cost of production and fails to appear as part of the economy's final output."[c]

36. The aim of the present section is to translate this unease into identifiable problems and offer possible solutions. It will argue that there is a range of problems, the conflation of which leads to a sense of impotence or a desire for extreme responses. Starting from a vague sense of disquiet will not normally lead to a useful work programme. By trying to specify the issues more clearly, it may be possible to identify solutions. The present section divides the relevant concerns into four groups:

(a) Constructing accounts is made more difficult because much activity is new and very hard to measure;

(b) Conceptual problems with accounts become harder. There are two particular problems:

(i) The definition of intangible capital and its relation to investment. These are the well-known problems of research and development and human capital;

(ii) The measurement of quality change;

(c) Finally, there are problems of linking the accounts to public and policy concerns.

37. What we have is a combination of some genuinely new problems, the revival in a slightly different form of some familiar but difficult problems, and the emergence of some issues that have been dormant for some time. For progress to be made, issues must be separated so as to address new problems and clarify old ones. Merely revisiting in a different forum the problems so recently examined in the context of the System of National Accounts, 1993 (1993 SNA) is likely to ensure progress. Much of the present section will therefore be devoted to the first and last of the four issues mentioned above.

38. The present section is largely based on the dichotomy between those who use national accounts as a measure of welfare and those who use them to measure capacity. Although many national accountants do not endorse the view that national accounts measure welfare, much of the concern to which information technology has given rise comes from the beliefs of users that they do. Carter and Postner,[b] for example, base their proposals largely on a welfare interpretation of national accounts. The above-mentioned article by Michael Prowse[c] is typical of policy makers' and analysts' concerns with capacity. Although national accounts can provide material for measuring welfare or capacity, providing such measures is not the function of core accounts. The contention of the present section is that much of the current disquiet derives from either a belief that accounts should do things they were not designed to do or a justified feeling that it is harder to maintain the relevance of economic statistics in a period of rapid change. Neither belief, however, justifies a radical change in the systems of national accounts. What is needed is a three-pronged approach, involving the collection of more and more relevant data, the review of the links between economic accounts and policy issues, and a reassertion of the role of economic accounts and their limits.

39. The present section is divided into six subsections (A through E), covering introductory material; definition of the terms of discussion; industry and product; how to reinforce the links between national accounts and issues of policy and general concern; how technology may change the process of data collection and the nature of policy itself; and conclusions and recommendations.

B. What are the effects of information technology?

40. There can be little doubt that new techniques of communications, information etc. are changing the nature of our economy. Although such changes are probably no greater than those associated with the development of railways,

the car or electricity, they are arguably the most significant since the development of our present system of economic statistics. Just as the development of the railways altered notions of time, so the development of information technology is widely expected to change many traditional concepts.

41. The concern people feel about the impact of information technology is expressed in terms of the increasing intangibility of the economy. The term "intangible" is an adjective. Much of the confusion that surrounds the issues it raises is generated by the illusion that there is a set of distinct entities called intangibles. But, it is much simpler to look at intangibility as one aspect of a range of variables. When people talk of the increasing intangibility of the economy, they are speaking about developments in industrial production such as the rapid development of microprocessors for information-related products; transactions such as communication over the Internet; productive assets, such as software and research; and commercial assets, such as patents, goodwill, corporate organization and skilled staff. These various developments, however, overlap only partly.

42. There has always been an intangible element to nearly all dimensions of the economy. What has changed recently is that intangibility has increased in most of those dimensions, and the area in which several dimensions of intangibility overlap has increased as a result. The speed of that change has aggravated the chronic difficulty that statisticians face in tracking an economy in flux, and the increased complexity of the links among transactors has strained the relationship between statistics and policy concerns.

C. Industry and product

1. Industrial classification

43. The one element to which the term intangible does not seem readily to apply is production: whatever is being produced, the production process itself seems to be reasonably clear and well specified. The difficulty arises because most of the units used to measure production, such as product or input, are both less easy to measure and have less well-defined links with the scale of the production process.

44. One response to the problem has been the development of the North American Industrial Classification System (NAICS), a system of industrial classification that builds on the International Standard Industrial Classification of all Economic Activities (ISIC). The recent paper by Carter and Postner[b] tries to move beyond industrial classification to what is termed "bending of the 1993 SNA". NAICS agreement No. 18 suggests the creation of an industrial classification for information, to be treated as distinct from goods and services. The classification would encompass parts of the existing goods and service industries, mainly services. The characteristics identified as justifying such a third category are:

(a) Variability of form;

(b) No direct contact between transactors;

(c) Value does not lie in tangible qualities;

(d) Easy to copy;

(e) Property defined in terms of rights - ease of distribution;

(f) Distributors can easily add value.

45. The above-mentioned characteristics appear to be characteristics of products rather than of industries. The case for approaching the problem through industrial classification is based on the premise that the link between product and industry is the main source of concern. Any review of options should re-examine this issue, and should consider whether industrial classification should take precedence over, say, commodity classification, or whether the traditional distinction between goods and services is as fundamental as it once was.

46. Within the NAICS framework, there is a range of other activities that might also be candidates for inclusion in the classification of information type. In terms of technological characteristics, there are a range of products in the field of biotechnology that are often associated with similarly rapid technical advances and intellectual characteristics that make the definition of rights complex. Although the legal definition of property rights in the pharmaceutical area is more elaborate, the fruits of scientific research are becoming increasingly difficult to package into a commodity. There may be a case for including parts of the medical and pharmaceutical industries with the new sector. In addition, sport has various characteristics, such as artistic production.

47. A different argument might apply to large parts of public services. Arrow[b] has pointed out that many information products have characteristics that are similar to public services. The provision of defence and security by States has always been measured in terms that are conventional to the point of distortion. Environmental services could be regarded in a similar light. Although the 1993 SNA still identifies the public sector as a consumer, the provision for transfer in kind to the final user implies a recognition of the same point. Products are used in a way that obviates any link between producer and consumer, and location is vague. It could be argued that the timing of production and consumption are also somewhat out of joint. The private provision of security is arguably more appropriable but is otherwise quite similar, and insurance is notoriously tricky for the current system. An even stronger case can be made for education, which has many of the use characteristics of information industries and is likely to increasingly partake of their technical characteristics.

48. Any new industrial classification needs to be fairly thoroughgoing so that it is clear what are goods, what are services and what is information-related. It would seem that goods can no longer be defined in terms of their physical characteristics. Goods should include only products that have a reasonably uniform and predictable set of characteristics. Services should encompass commodities for which a contract can be identified and a clear link established between producer and consumer. Information-related products cover the remainder, that is, they are defined to some extent by negative characteristics.

49. One important function of an industrial classification is the analysis of stages in the economic development of economies. There is a widespread belief that information technology is a factor in maintaining the lead of industrial countries relative to third world countries. Although much of the cost of such products as consumer durables lies in physical elements that could be produced cheaply in the third world, much of the value added lies in high technology elements in the original product and in its servicing, which keep production close to markets. In so far as analysts track economic progress by the share of different industries in GDP, classifications will need to assess such developments.

50. There must be some concern about revising ISIC so soon. The flexibility provided in the 1993 SNA by the introduction of satellites seems to provide the opportunity to present an alternative classification. Intangibility affects industries and products, and therefore requires a restructuring of input-output tables that would enable countries to experiment with the new classification while maintaining comparability with other countries. It will be argued below that satellites will in any case be needed for other purposes. Even if it is clear, on examination, that industrial classification needs to change, this is unlikely to be the whole story.

2. Trade and investment

51. Time and place raise further difficulties. The lack of a direct link between producer and consumer means that production and consumption need not take place either in the same place or at the same time. As long as there are commercial transactions that can be recorded, accounts at current prices can still be compiled with the usual techniques. If all that can be sold over the Internet is the opportunity to gain access to a data set or read a bulletin board, then that is the output. This is no more problematic than transactions in commodities, such as insurance or perennial flowers. In such cases, the transaction is merely providing access to a continuous service, and represents only a loose approximation of the value and location of what is accessed. This approach is already used in the 1993 SNA for an important area of information production - own account computer software. Similarly, the problems of national location of production are already well recognized.

52. One way to address this range of problems would be to develop a classification for both visible and invisible trade that matches the new industrial classification evolved from NAICS. The current classification of service trades has less sophistication than its visible trade equivalent. A breakdown of international trade similar to the breakdown of production would seem to be the logical next step, which, like its production equivalent, would preserve the form of accounts but might not address the whole of the concern.

3. Prices and deflation

53. Partitioning of current price GDP changes into price and volume has also become difficult. The problems of quality change and heterogeneity have long been recognized as a problem in deflation. The divorce between output and

outcome has meant that the form of the transaction even in traditional services may bear little relation to the value of the service to either producer or consumer. Hedonic pricing techniques are being developed in an attempt to address that problem. Information technology, by stepping up the speed at which products change their form and quality, may have added to the pressures on any system of hedonic indices. To date, such techniques have been most successful on producers' goods, but the theory of derived demand - upon which assessment of intermediate products must rely - may come under some pressure.

54. The development of information technology means that for companies to make money products must be charged for by charging for general access to them rather than on a per-unit basis. This means that what is being paid in no way represents either the scale of what is purchased or, except as a minimum, its value. Once a television licence is purchased or an Internet connection made, the usage made is not subject to direct charge, and products contributing to welfare cannot therefore be linked to a transaction.

D. Linking economic statistics and policy concerns

55. National accounts have traditionally underpinned the analysis of economic policy, and are increasingly expected to help with wider policy concerns. Inflation and welfare are major concerns of economic policy. As in early developments of national accounts, inflation is seen to be related to capacity utilization. Keynes's paper "How to pay for the war", for example, was designed not to find the resources to fight the war, which he argued would inevitably be forthcoming, but to do so in a way that minimized inflationary pressures.

56. With the development of information-type industries, the notion of resources and productive potential will increasingly become divorced from traditional concepts. The divorce of output from welfare is already the subject of much literature, dating back at least to Tobin and Nordhaus in 1972. The development of information industries only complicates the matter further. The flexibility provided by satellite accounts, social accounting matrices and quality adjustment in price indices should enable national accounts to address many of the issues.

1. Capacity

57. Capacity is linked to accounts through the notion of factors of production. The notions of factors of production and incomes owing to them are rooted in the theories of the political economists of the late eighteenth and early nineteenth centuries. Such notions lie at the root of the distinction between primary incomes that form part of the gross national income (GNI) and transfers of income that do not. The nature of information technology challenges those traditional notions, which are based on physical processes that use labour, land and capital to process raw material and produce an output. The value added in industries using information technology, as well as the values that create it, are different in nature, and output will become more unstable and harder to record.

58. It will increasingly be the control by companies of intellectual property, generating quasi-rents, that will determine their profits. Company balance sheets already display a range of such assets, such as brands, patents and goodwill. Accountants, however, remain concerned that these are not sufficient to reflect the full value of companies; they do not reflect the organizational assets of a company, for example. We have already seen that a trained workforce itself is only an asset to its employers so long as they remain in its employment. Training is therefore a national asset that cannot be appropriated to individual companies and therefore should appear at least in part as an asset of the household sector. By contrast, there are some company sector assets that are only partly of value to society as a whole. Although brands represent value to the consumer to some extent by acting as a symbol of quality, they are mainly designed to enable companies to extract quasi-rents from production that put a divergence between price and cost or value. Such assets are in effect a claim on the future income of others, and as such should, like financial assets, be offset by liabilities in other balance sheets. This is most striking in the case of patents that arise not from the research efforts of the patentors but as a result of the patenting of what was previously or would otherwise have been common. Thus, much of company surplus will be a reward not for risk-taking and enterprise, as traditionally conceived, but for the ability to generate or acquire unique assets and maintain their uniqueness. Such assets represent the right to transfers rather than to increase or enhance production. As such, they cannot be seen as an enhancement of national capacity. Their tendency, unlike much traditional fixed capital, will be to reinforce rather than to abate inflation.

59. Labour will become increasingly diverse. The importance of experience and training will mean that an increasing share of the rewards to labour will in effect be returns to embedded capital. What are normally called wages and salaries thus already contains and will in future contain more of an element of returns to investment, even though that investment may have been financed by someone else, which will blur the current distinction between factor incomes. The notion of a transfer will need to be applied more widely, and will thus threaten the clarity of not only the allocation of GNI but also its total. The distinction between returns to factors of production and other income transfers will become vaguer and will thus make the total GNI more ambiguous. Such issues have all been well rehearsed in the context of the debate on human capital.

60. The questions that policy makers ask about the capacity of the economy remain relevant. The response from economic statistics will therefore have to be further developed, for example through more disaggregated input-output analysis. In traditional input-output analysis, it is almost impossible to distinguish the technologies of such service industries as retail or cleansing, which use predominantly unskilled labour, and finance or health, which use a substantial fraction of qualified labour. Disaggregations along the lines proposed by social accounting matrices will enable such distinctions to be clarified and analysed. The idea of fixed coefficients of production, as implied in input-output analysis, may be hard to sustain. As Goldfinger[b] puts it, information creates a non-linear world.

2. Welfare

61. In section II.A above, two main trends were identified in the use of national accounts - monitoring capacity and monitoring welfare. Monitoring capacity was discussed in paragraphs 57-60 above. In recent years, the role of national accounts in monitoring welfare has been subject to sustained attack. National accountants themselves have resisted the idea that GDP measures welfare. Yet critics and more sympathetic analysts continue to seek in national accounts for a means of measuring welfare. We have already referred to satellite accounts as the context in which to present new industry and product classifications. They could also be used to develop indicators of welfare. The ability to combine monetary and non-monetary statistics creates the possibility of linking outputs to outcomes and thus to welfare.

62. The 1993 SNA, in chapter 16, section 1, explains the difference between outcomes and outputs by noting that the output of the health services needs to be clearly distinguished from the health of the community. Similarly, the output of the education service is quite different from the level of knowledge or skills possessed by members of the community.

63. Traditionally, national accounts have dealt with links between outputs and inputs. Any attempt to measure welfare, however, must deal with outcomes rather than outputs. The provision in the 1993 SNA for satellite accounts can be seen as a way to address this challenge. If we are to use satellite accounts to develop wider measures of welfare, then we shall need a framework into which to put them. The strength of the core accounts was that such a framework emerged automatically. Satellite accounts, while they employ accounting disciplines as an aid to compilation and drawing more value out of statistics, do not provide an overall framework. Because satellites can be put together using a variety of units and without any overall structure that ensures comprehensive coverage and absence of overlaps, they cannot be relied on to measure consistently in the way that the traditional national accounts can. While the SNA specifies the internal structure of each account to ensure consistency within each account, it does less to ensure consistency and comprehensiveness among individual accounts.

64. The following two paragraphs can do no more than sketch one of a range of possible solutions. The suggestion made here is designed more as a provocative illustration of the kind of approach that is envisaged. There will be many others, and any further work will need to narrow and clarify the options.

65. One system of economic frameworks that could be developed to cover this wider picture is Amartya Sen's system of functionings, entitlements and capabilities. This system has been developed over an extensive literature, which can only be crudely summarized here. Very roughly, a functioning is something like enjoying a meal, and entitlement is access to the means of fulfilling wants and needs. For example, it has been used extensively by Sen in the analysis of famine, where what matters is what food is accessible from a range of sources. The system could also be applied to computer access. Broadly speaking, functionings correspond to consumption and entitlements to income. In industrial countries, the main source of entitlement is employment or social security transfers. However, both apply directly to market transactions and to

other influences on human activity and the capacity to make choices. Capabilities refer to the capacity to earn entitlements and use resources to achieve functions. They are a modifier that transforms activities into functionings.

66. These could be made operational in a time-use framework. For many activities, the appropriate metric of the functionings that are the elements of welfare are quality and time. The pattern of time use in terms of sequence and interruptedness may vary, but the quality of peoples' lives can be loosely assessed by comparing the amount of time spent doing things about which they feel positive and with the amount of time doing things about which they feel negative. Investment in enhanced capability will be an important modifier of the level of welfare to be derived from activities, as well as an indication of the capacity to achieve entitlements. The development of a time-use framework and welfare metrics based on it will help to address the need to measure welfare directly, as the link between output and outcome becomes more remote.

E. Sources and uses of economic statistics

67. The present section has discussed the impact of information technology on the nature of the economy and the way in which the changes that it brings about might alter the way in which that impact should be measured. The way in which technology itself will affect suppliers of data and users of the accounts is considered below.

1. Statistical sources

68. One of the main sources of concern about intangibility is the speed at which the economy is changing. This underlines the chronic problem faced by economic statisticians: they cover traditional parts of the economy well and new parts less well. This is to some extent inevitable, but it requires special efforts to overcome when the system appears to be losing relevance. In some ways, the national accounts mitigate this problem. A system based purely on measuring production is more vulnerable than one that also monitors expenditure and income. While all these measures suffer to some extent, the possibility of balancing different measures ensures a more general coverage. Although we may well fail to survey traders producing new kinds of products, we are less likely to miss the consumer spending on them, or the employment producing them.

69. New technology highlights such problems but may also offer some help. We are already seeing the impact of information technology on the collection of data from traders. In the next few years, the ability of firms to send data electronically and download it from their systems will not only have a substantial impact on compliance costs and the costs of national statistical offices but will also have an impact on sample sizes and the frequency of monitoring. It may eventually become possible to monitor the economy more rapidly and at greater frequency. Data supply could also become much more of an interactive process, with data being compiled and disseminated along the same links.

70. It is also possible to envisage similar developments on the personal survey side. Again, there are already considerable technical advances in computer-aided interviewing, but if households are to become routinely connected to some kind of low-cost information network, then the scope for large sample and timely monitoring will also be available.

2. New policy concerns

71. The changes in the nature of the economy may have an impact on what issues become the concerns of policy makers. Here there is probably little value in speculation. We have already discussed the increasing fragility of the balance of payments and the location of production and value added. Similar concerns will apply to notions of capital stock and the stock of money, while concerns about inflation and the overheating of the economy or the underuse of resources will take on very different meanings. A recent example is given by Robert Reich, writing in the Financial Times: "More value is added through design, styling, manufacturing-engineering, advertising, marketing, servicing, selling, consulting, advising. As a result of this continuing shift in the value-added composition of goods and services, increases in the price of materials or energy pose less of an inflationary threat."[d]

72. Such speculations go far beyond the scope of the present section, but it would seem wise to start the process of thought so that the next SNA can be up to date with what might be the concerns of policy makers by the time it has completed its deliberations.

73. One example is the problem of inflation. As products become more heterogeneous and change their nature more frequently, it will become increasingly difficult to identify something that could be called a cost of living and something that could be called a rate of inflation. Policy makers using cost-of-living adjustments for the purposes of calculating benefits are already baffled by the ambiguities that quality change brings into measurement. The concept of inflation has played a range of roles in economic policy, and there has been concern that one indicator cannot necessarily capture all those roles. The use of such concepts as entitlement (see paras. 65 and 66 above), may help to sort out some of those roles, while roles that reflect a notion of social dislocation may require very different indicators that may or may not be obtainable from national accounts.

74. The link between money and prices or transaction is likely to be affected by information technology in two ways. The development of electronic money may undermine the concept of a well-defined transaction, as well as both the traditional role of money and the role of traditional money in the economy. The output of the banking sector, including central banks, will become even more elusive. At the same time, the idea of a stock of money held for transaction purposes that has lain at the heart of much analysis of monetary phenomena is likely to be more unstable and harder to measure, let alone control or target.

F. Conclusions and recommendations

75. Information technology represents arguably the biggest technical change to the economy since the current system of measuring the economy was put in place. Even so, it does not represent a fundamental threat to the system of measurement. National accounts remain perfectly feasible. What is under threat is the relevance of such accounts to policy and user concerns. It is also likely that the nature of policy concerns will change.

76. The present section has only sketched a wide range of problems that affect many aspects of economic statistics and national accounts. It is suggested that an expert group be set the task of further analysing those issues. In the first instance, the group could operate by correspondence, holding meetings when the opportunity arises. The Statistical Commission may wish to establish the membership of such a group and define its terms of reference along the following lines:

Data

1. Examine the balance of data collection on intangible aspects of the economy.

2. Review the links between company and national accounts of intangible assets.

3. Review the implications for data compilation of electronic data capture.

Classification

4. Consider the proposals for an information sector, as in NAICS.

5. Review other classifications, in the light of which a parallel development of product and trade classification might also be considered.

Links between accounts and users

6. Consider the application of disaggregated input-output to capacity measurement.

7. Review the role of external satellites in welfare measurement.

8. Design a comprehensive framework for different satellites.

Policy

9. Hold discussions with policy makers and analysts on the likely development of policy concerns.

General

10. Seek ways of restoring confidence in national accounts by expounding the strengths and limitations of accounts.

III. QUALITY OF LABOUR

77. The present section on quality of labour (see E/CN.3/1997/2, sect. III.J) has been contributed by the Voorburg Group on Service Statistics.

78. The Voorburg Group on Service Statistics has been concerned with the employment issue since its seventh meeting. Although growth in overall economic activity has slowed significantly in the last two decades, in most countries a substantial growth in the service sector's share of the total employment has taken place over the same period. Governments and policy makers increasingly see the service sector as the job-creating sector of the economy, and require statistical information on total labour volume, the composition of the labour force in the services sector and the development of those characteristics over time.

79. At its eleventh meeting, held at Newport, Wales, in September 1996, the Voorburg Group dedicated one day to the employment issue, and considered problems with and comparability between employment data obtained from different sources, such as business and household surveys and administrative registers.

80. The Group also considered empirical matters, such as data collection methods and data evaluation, including definitions of the variables and concepts used, and discussed an enlarged employment module in the context of model surveys of the service sector. Rapid changes in the organization of work relations, including contracting out and increasing levels of part-time employment and temporary work, put pressure on statistical offices to provide new definitions and harmonize concepts used in different countries in order to make reliable international comparisons.

81. The Group also addressed the "good job-bad job" polarization in the creation of new jobs in the service sector, an issue of great political importance in many of the participating countries.

82. The proposed employment module incorporates variables measuring not only the volume of the employment in the service sector but also the formal and informal qualifications of the persons employed.

83. For future work, the Voorburg Group decided to:

(a) Contribute concepts and definitions for data on employment in the service sector that are suitable for improving national and international comparability;

(b) Enlarge the employment module as part of model surveys;

(c) Devote one day to dealing with employment issues at its next meeting, to be held at Copenhagen in 1997.

84. If successful, the results of the Group's discussion of a revised employment module will be added to the model surveys and placed at the disposal of the international statistical community for broader review.

IV. RESOURCE ACCOUNTING

85. The present section on resource accounting (see E/CN.3/1997/2, sect. III.H) has been contributed by the London Group on Resource Accounting.

A. Background

86. Growing concerns about environmental degradation, resource depletion and the sustainability of economic development have led to new thinking about the relationship between environmental change and economic activity, as reflected in the 1993 SNA. Following publication of the Handbook of National Accounting: Integrated Environmental and Economic Accounting,* many countries are now working to develop satellite environmental accounting systems, and considerable experience has already been accumulated in the field of natural resource accounting and - more broadly - environmental accounting. Nevertheless, there are still many conceptual and measurement issues in this new field. The international comparability, credibility and general usefulness of environmental accounts will be limited until such matters are better resolved. Since countries each have different relative strengths and all have limited financial means, considerable benefit can be realized from sharing international efforts to develop resource and environmental accounting concepts and methods.

87. A number of developed countries decided in mid-1993 to create a forum among themselves for discussion along the lines of the Voorburg Group, this time called the London Group. The Group deals with both the pros and the cons of interaction between the economy and the environment: natural resource accounting on the one hand and pollution accounting on the other. The work of the Group involves both physical accounting and valuation work. Time series, linked to traditional national accounts concepts, are central.

88. At its first meeting, held in London in 1994, the Group focused on a survey of countries' work to date, the contents of and comparison between existing frameworks for integrating environmental and economic data, and the pros and cons of adjusting national accounts aggregates. At its second meeting, held in Washington in 1995, the Group considered a broad range of more specific topics: valuation methods for depletion, the costs of pollution abatement, the application of input-output and other models, international linkages, and the

valuation of air and water pollution. At its third meeting, held at Stockholm in 1996, it was decided to go into more detail on a few selected topics: forest accounting, material flows and the cost of pollution.

89. The Group functions rather loosely and depends on the active participation of its members for its success. All participating countries are expected to contribute papers and to get involved in discussions. The membership consists of invited representatives from industrialized countries and from the major international organizations. Practising national accounts statisticians are heavily represented among the Group. All participants pay their own way. The meetings are hosted voluntarily by participants, one at a time. To date, the United Kingdom of Great Britain and Northern Ireland, the United States of America and Sweden have each kindly provided facilities and secretarial functions for one of the meetings. A papers and proceedings volume is compiled after each meeting.

B. Assessment of the past and directions for future work

90. The London Group has proved very useful in providing a forum for exchange of experience and discussion of the problems of implementing environmental accounting integrated with national accounts. Its work has led to a clarification of concepts and a clearer idea of statistical possibilities and problems. Participants have been encouraged and stimulated by the example of what practical results have been achieved in other countries similar to their own.

91. Participating countries have more resources than most to test out the methodologies for environmental accounting. The lessons learned can help to foster the development of natural resource accounting throughout the world. Their priorities, however, are sometimes slightly different, and some issues that may be important in other regions, such as soil erosion, are unlikely to attract high priority.

92. The size of the Group is a good compromise: small enough to be effective but large enough to encompass a wide range of experience. The papers submitted to the meetings would be valuable to a larger audience of national and environmental accountants, and they should receive wider circulation on the understanding that they do not necessarily reflect the consensus of the Group.

93. Considerable progress has been made in some areas and consensus is emerging on a number of issues. In many others, the Group is not yet in a position to recommend standards or best practice. Since environmental accounting is still in its infancy it is continuously evolving and developing, so that in its present state existing systems and approaches should be seen as models or pilot projects rather than as agreed standards. The System of Integrated Environmental and Economic Accounting itself is an interim version, which is described in the preface to the above-mentioned Handbook as a work in progress.

94. Even within the relatively homogenous London Group, the environmental problems and therefore data priorities of countries differ considerably; certain

blocks of issues, however, stand out as important to a sufficiently broad group of countries to be worth pursuing together.

95. At this stage, priority should be given to collecting the basic sets of data needed to compile and test environmental accounts rather than spending too much time on refinements of the frameworks.

96. The work of the London Group in the next few years will focus on:

(a) Tidying up some of the remaining issues in the relatively well tested areas of resource accounting, such as sub-soil assets and forests;

(b) Developing new relatively underexplored areas, such as accounts for water (availability, use, pollution);

(c) Environmental protection: linking expenditures, technologies, emissions and pollution costs;

(d) Experiments with assessing environmental damage and its monetary valuation.

97. There is an emerging consensus that it is necessary to review the treatment of natural resources depletion in the national accounts of the SNA itself on essentially economic grounds, that is, selling one's assets should not appear as current income. For wider environmental concerns, however, the London Group leans towards the view that a properly adjusted "eco-GDP" for estimating what GDP would have been if the economy had been on a sustainable path, in which all prices and quantities would have been different, could only be derived from an economic model and not from a simple accounting deduction. In the view of many participants, such modelling and scenario-building work could be more appropriately carried out by economic research institutes than by national statistical agencies.

V. MEASURING PRICE CHANGE

98. The present section on measuring price change (see E/CN.3/1997/2, sect. III.I) constitutes a progress report contributed by the Ottawa Group on Consumer Price Statistics in October 1996.

A. Terms of reference

99. The Ottawa Group was established in 1994 to promote technical discussions on crucial problems of measuring price change and to propose concrete solutions. More specifically, the discussions of the Group focus on conceptual aspects of the Consumer Price Index (CPI), in particular on the possibility of estimating CPI biases and on differences between CPIs and harmonized means of measuring inflation. The Group will also look at other matters involving consumer and producer prices. The Group is composed of experts from seven countries and the Statistical Office of the European Community (Eurostat), and it meets annually. Participation at the meeting is conditional upon submission of a paper dealing

with one of the issues on the agenda. There are no formal recommendations at the end of meetings, but their proceedings are published, including the papers presented (or their summaries) and the main points of discussion.

B. Lessons learned

100. Since 1994, there have been two meetings of the Group, at Ottawa and at Stockholm, dealing with the following issues:

(a) Choice of formula;

(b) Estimation of bias in the CPI;

(c) Purposes and concepts of consumer price indices;

(d) Selected difficult areas of consumer price indices;

(e) Product quality adjustment to prices.

A list of the papers presented at those two meetings of the Ottawa Group is contained in appendix I.

101. A number of lessons were learned from the meetings of the Group. For instance, the discussion of the first issue mentioned above revealed that the choice of index formula at the microlevel can make an enormous difference in practice. Although no firm recommendation was made, it appeared that several participants were in favour of more extensive use of geometric means.

102. On the issue of bias, many countries have accepted the empirical estimation of the American bias and have used it in their own context, although some participants did not accept the cost-of-living index as an appropriate framework for judging the CPI. For some participants, the CPI should only reflect pure price change, and therefore the failure of a fixed weight index to capture product substitution should not be seen as a source of bias. However, most if not all participants recognized that the CPI is more than a mere statistic; it is an institution that must be regarded as credible, and questions of bias therefore need to be addressed in the course of future research activities and meetings.

103. On the third issue mentioned above, it was recognized that an index is used primarily as a guide to compensation, whether it is called a cost-of-living index or not, and therefore an index designed to measure inflation should not necessarily coincide with it. Given that two official measures of CPI might create confusion in the public perception, it was suggested that a variety of alternative analytical measures would be preferable. It was agreed that the topic should be revisited at future meetings.

104. Finally, on the issue of product quality adjustment to prices, the empirical evidence derived by comparing the differences between index behaviour and the behaviour of average prices of sampled items indicated that the bias could go in many directions. Although the discussion shed light on the problem

of product quality adjustments, a number of related issues remain to be addressed.

105. A third meeting of the Ottawa Group is planned for April 1997 at Voorburg, the Netherlands, at which the Group intends to deal with the following themes:

(a) Inflation measurement, including alternative CPIs;

(b) Conceptual problems: durable goods, financial services, new goods and/or outlets, quality change;

(c) CPI survey methodology: electronic database and scanner, centralized collection of data;

(d) New developments.

VI. CAPITAL

106. The present section on capital (see E/CN.3/1997/2, sect. III.G) has been contributed by the Australian Bureau of Statistics, as the Convener of a proposed conference on capital stock statistics.

107. In response to decisions taken by the Working Group on International Statistical Programmes and Coordination at its eighteenth session, the Australian Bureau of Statistics will be hosting a conference on capital stock statistics from 10 to 14 March 1997 in Canberra.

108. The major theme of the conference will be measurement problems related to non-financial produced assets of the national balance sheet. The issues to be discussed at the conference are set out in table 4, and include methods for estimating capital stock, including the perpetual inventory method and direct survey methods; concepts of capital for different purposes, such as balance sheets and productivity analysis; issues for national balance sheets; and extensions of the 1993 SNA capital boundary, such as computer software, mineral exploration and non-weapon military equipment.

109. Country views and experiences will be shared and areas for fruitful future collaboration identified. The conference will consider the merits of a future meeting on the topic.

110. Invitations have been sent to a representative range of countries for the meeting. International agencies have also been invited.

111. Papers and proceedings of the conference will be made available to the United Nations Statistics Division for wider dissemination.

VII. MEASUREMENT OF THE INFORMAL SECTOR

112. The present section on measurement of the informal sector (see E/CN.3/1997/2, sect. III.E) has been contributed by the Central Statistical Organization, Department of Statistics of the Government of India, as the Convener of the proposed Delhi Group on Informal Sector Statistics.

113. At its eighteenth session, the Working Group on International Statistical Programmes and Coordination had endorsed a proposal of the Expert Group on Critical Problems in Economic Statistics for the constitution of various Voorburg-type groups to address such problems. Subsequently, India expressed interest in constituting a group on informal sector statistics, to be known as the Delhi Group. A preliminary concept paper bringing out, inter alia, the issues that could be addressed by the Delhi Group was developed and forwarded to the United Nations Statistics Division for comments. The Statistics Division encouraged the constitution of a group on informal sector statistics and included it in the listing of the groups sent to national statistical agencies. Countries interested in the work of the Delhi Group were invited by the Statistics Division to contact the Indian Central Statistical Organization directly.

114. The informal sector has a visible presence in almost all of the developing countries, yet only a few countries include statistical activities in the informal sector in their regular programme of data collection. There have been some activities at the international level, such as projects of the International Labour Organization (ILO) in Columbia, the Philippines and the United Republic of Tanzania, which focused on employment in the informal sector. India, with its vast experience in household sample surveys, has accumulated a wealth of information on statistical methodologies of survey design and data collection in the informal sector.

115. The objectives of the Delhi Group will be to document the data-collection practices in the informal sector that are followed by member countries and to develop suitable methodologies for survey design and data collection in the sector. The Group will concentrate more on operational aspects than on theoretical exercises. Ancillary objectives of the Group will be the promotion and use of informal sector statistics in Government administration; planning; giving technical and advisory support to countries in need; and related activities.

116. The preliminary concept paper, together with the comments received from the Statistics Division, were circulated to the Organisation for Economic Cooperation and Development (OECD), the ILO and Eurostat in September 1996, requesting their participation in the Delhi Group. Eurostat has already communicated its inability to participate directly in the work programme of the Delhi Group, owing to lack of resources and its limited experience. Replies from the ILO and OECD are awaited. The Philippines, Colombia, Pakistan, Bangladesh and Sri Lanka are other countries that were approached in October 1996 to consider joining the Delhi Group; their replies are also awaited. The interest of other countries in joining the Delhi Group is also being solicited. There has been some communication on the subject with the International Statistical Institute in The Hague and the former Yugoslav

Republic of Macedonia has expressed interest in the activities of the Delhi Group. These communications are likely to take a more formal shape in the next couple of months.

117. To date, no secretariat for the Delhi Group has been set up. An ad hoc arrangement for the preliminary work of the Group has been made with the Economic Census and Surveys Division, Central Statistical Organization, Department of Statistics of the Government of India; the Division is responsible for setting up statistical databases for the informal sector in India. The modus operandi of the working of the Delhi Group has not yet been finalized. Similarly, a decision on the status of the secretariat of the Delhi Group - whether it will function as a bureau or as a permanent office - is yet to be taken.

118. The concept paper prepared earlier has been modified elaborately, mostly based on comments from the United Nations Statistics Division, and the present state of the informal sector in India has been documented in another status paper; both papers are before the Commission as background documents. It is planned to organize the first preliminary meeting of the Delhi Group at New Delhi in about January 1997. The technical details, specific terms of reference and operational details of the Group are to be discussed, finalized and adopted at that meeting. The United Nations Statistics Division, the Economic and Social Commission for Asia and the Pacific (ESCAP) and the ILO will convene a joint Asian workshop on informal sector statistics at Bangkok from 12 to 17 May 1997. The workshop will obviously have the Asian context as its framework, but even within the Asian context there are likely to be wide disparities. The Delhi Group could select two or three issues from the workshop for detailed follow-up. It is proposed to contribute to the Bangkok workshop an India country paper summarizing the status of informal sector statistics in the country, and a second paper giving details on the updated terms of reference of the Delhi Group. It is further proposed to convene a second meeting of the Delhi Group at Bangkok to coincide with the workshop.

119. The tentative calendar of events for the Delhi Group is given below:

November 1996

Circulate the provisional agenda for the first meeting of the Delhi Group

January 1997

Hold the first meeting of the Delhi Group

March 1997

Send revised paper for discussion at the Bangkok workshop to the United Nations Statistics Division, ESCAP and the ILO

April 1997

Prepare a country paper for the Bangkok workshop

May 1997

Hold the second meeting of the Delhi Group at Bangkok to coincide with the ESCAP workshop

VIII. LABOUR AND COMPENSATION

120. The present section on labour and compensation (see E/CN.3/1997/2, sect. III.K) has been contributed by the Institut national de la statistique et des études économiques (INSEE), as the Convener of the proposed consultation group on labour and compensation.

121. At its eighteenth session, the Working Group on International Statistical Programmes and Coordination suggested that an informal consultation group on labour and compensation be created provided that a sufficient number of countries/organizations were willing to participate. The group would be organized and would function along the lines of the Voorburg Group on Service Statistics, which has been active for almost 10 years.

122. INSEE is prepared to convene the labour and compensation group. However, given that an international group has recently been initiated at OECD to deal with concepts and methods of analysis of current labour markets in developed countries, it seems that the new labour and compensation group should have a different purpose. On the one hand, it should certainly have a wider geographical scope and should not limit itself to labour and compensation in statistically and economically developed countries only. On the other hand, at least in its initial phase, it should focus its attention not on the general conceptual and methodological problems associated with labour and compensation but rather on the existing statistics in this domain.

123. The idea would be to update or gather precise information about the content and comparability of labour statistics that countries participating in the United Nations statistical programme already publish on a regular basis in major United Nations statistical publications. For each of these countries and for each set of labour data, the group could produce a standardized document containing all the relevant "information about information" in the field of labour statistics. Such "metadata" could be somewhat similar to the dissemination standards that the International Monetary Fund (IMF) has recently implemented for a subset of mostly developed countries on a voluntary basis.

124. Once this first stage of collecting information and summarizing it in a standardized and convenient way is completed, the group could explore, with the help and agreement of the United Nations Statistics Division, the possibility of providing public access to those metadata, possibly via the Internet.

125. Depending on the conclusions reached by the group about the quality and comparability of labour statistics, such as those summarized in the metadata, the group might decide whether it is worthwhile or not to pursue its activity. A possible future goal of the group could be to provide guidelines for improving the quality, international comparability and transparency of labour statistics

in order to help national statistical agencies to develop their statistical systems in the field of labour statistics.

126. The ILO has already expressed its interest in participating in such an informal working group on labour and compensation. Obviously, the ILO should play a major part in such a programme. The proposed calendar of events for the group is as follows:

November 1996 to February 1997

Contacts with international institutions already engaged in improving labour market statistics (ILO, OECD, Eurostat). Selection of group members and agreement on a more explicit programme, to be submitted for approval to the twenty-ninth session of the Statistical Commission

Spring of 1997

First meeting of the group in Paris or New York or at Geneva, whichever is more convenient for group members. Final draft of a questionnaire to be sent to labour statisticians in all countries participating in United Nations statistical activities

Spring of 1997 to end of 1997

Gathering and processing of the information collected through the questionnaires

End of 1997/early 1998

Second meeting of the group. Preparation of a detailed report, including proposals for disseminating the metadata. Report and proposals to be submitted for approval to the Commission's Working Group at its nineteenth session. At that time, it would be considered whether a second and more guidelines-oriented phase of work should be undertaken, either under the responsibility of the same group or with a renewed group of countries/organizations.

IX. POINTS FOR DISCUSSION

127. The Statistical Commission may wish to address the following questions:

(a) Do the issues identified in the present report and in the report of the Expert Group on Critical Problems in Economic Statistics (E/CN.3/1997/2) reflect the priorities of the Commission, and are the mechanisms proposed for dealing with those issues appropriate? Are there further critical issues that the Commission would like to propose for consideration?

(b) Does the Commission agree with the proposals for future work put forward by the various countries and/or groups?

(c) If the Commission agrees with the approach of utilizing informal consultation groups, how can the number of countries actively participating in the works of the various groups be increased?

Notes

[a] The goal of understanding how this situation affects firms and policies in one country does not address the complex statistical question of how to change the measurement system to accurately reflect and understand the phenomenon globally. That question would have to be addressed by a consideration of the role played by ownership in defining the domestic and foreign economic sectors in Canadian national accounting systems. See in J. McMechan and J. Ryten, "Globalizing the economic statistics system" (Statistics Canada, 1995).

[b] The original paper contains the following references:

Arrow, Kenneth (1962). Information as an economic commodity. In R. Nelson, ed., The Rate and Direction of Inventive Activity. Princeton University Press.

Carter, Anne, and Harry Postner (1996). National accounts concepts and statistics for an information economy. Paper presented at the Twenty-fourth General Conference of the International Association for Research in Income and Wealth, Lillehammer, Norway, August 1996.

Goldfinger, Charles (1996). Intangible economy and its implications for statistics and statisticians. Bologna: ISTAT.

Nordhaus, William, and James Tobin (1972). Economic Growth. New York: National Bureau of Economic Research.

NAICS (1996). Agreement No. 18. United States Federal Register, vol. 61, No. 103, p. 26603.

Sen, Amartya (1987). The Standard of Living. Cambridge.

[c] Michael Prowse, "How high can the eagle fly?", Financial Times, 26 August 1996.

[d] Financial Times, 24 September 1996.

[e] United Nations publication, Sales No. E.93.XVII.12.

Appendix I

LIST OF PAPERS PRESENTED AT THE FIRST AND SECOND MEETINGS OF THE OTTAWA GROUP ON CONSUMER PRICE STATISTICS, AT OTTAWA AND AT STOCKHOLM

Papers presented at Ottawa

Sampling and data capture issues in CPI construction
Marta F. Haworth, Central Statistical Office

Improvements to the food at home, shelter and prescription drug indexes in the U.S. Consumer Price Index
Paul A. Armknecht and Kenneth J. Stewart, Bureau of Labor Statistics

Constraining macro effects of the use of different methods at the basic level in the project to harmonize consumer price indices in the European Union
Don Sellwood, Eurostat

Choice of price index formula at the micro-aggregation level: the Canadian empirical evidence
Bohdan Schultz, Statistics Canada

On the first step in the calculation of a consumer price index
Bert Balk, Statistics Netherlands

Sensitivity analyses for harmonizing European consumer price indices
Jörgen Dalén, Statistics Sweden

A pragmatic approach to the selection of appropriate index formulae
Keith Woolford, Australian Bureau of Statistics

Comparative changes in average price and price index: two case studies
Alain Saglio, INSEE

Mark A. Wynne and Fiona D. Sigalla, "The consumer price index", Federal Reserve Bank of Dallas Economic Review, second quarter (1994).

W. Erwin Diewert, "Axiomatic and economic approaches to elementary price indexes", University of British Columbia Discussion Paper, No. 01-95 (January 1995), pp. 1-60.

A. G. Carruthers, D. J. Sellwood and P. D. Ward, "Recent developments in the retail price index", The Statistician, vol. 29, No. 1 (1980), pp. 1-32.

Papers presented at Stockholm

United Kingdom retail price index: a cost of living index or an inflation indicator?
Marta Haworth, Central Statistical Office

Three kinds of monthly CPI
Ralph Turvey

The consumer price index and income escalation
Bert Balk, Statistics Netherlands

Handbook of Inflation Accounting, chapter 5
Peter Hill

Seasonal commodities, high inflation and index number theory
W. Erwin Diewert, University of British Columbia

A statistical interpretation of CPI comparability
Jörgen Dalén, Statistics Sweden

Selected difficult areas in the Finnish CPI
Kaisa Weckström-Eno, Statistics Finland

Swedish CPI practices for difficult areas, with a note on CPI subindexes for services with income-dependent fees
Jörgen Dalén, Statistics Sweden

Note on the practices in the field of insurance, financial services and public price policies in the Icelandic CPI
Rósmundur Gudnason, Statistics Iceland

Note on selected difficult areas of consumer price indices
Lasse Sandberg, Statistics Norway

A note on cost-of-living indexes, subsidized commodities and income dependent prices
Anders Klevmarken, Uppsala University

Item and outlet replacements and quality adjustment
Ralph Turvey

Treatment of changes in product quality in consumer price indices
Bohdan Schultz, Statistics Canada

The type and extent of quality change adjustments in the Canadian CPI
Robin Lowe, Statistics Canada

Quality adjustment in the Swedish price index for clothing
Anders Norberg, Statistics Sweden

Quality adjustment of prices of audiovisual goods in the U.K. R.PI.
Marta Haworth, Central Statistical Office

The harmonization of quality adjustment practices in the European Union
Don Sellwood, Eurostat

Harmonization of consumer price indices: progress report
John Astin, Eurostat

Report from the Bureau of Labor Statistics for the House Budget Committee
United States Congress, Bureau of Labor Statistics

Quality adjustment in price indices: methods for inputting price and quality change
Paul Armknecht and Brent Moulton, Bureau of Labor Statistics

A comparison of estimators for elementary aggregates of the CPI
Brent Moulton and Karin Smedley, Bureau of Labor Statistics

Drift in producer price indices for the former USSR countries
François Lequiller and Kimberley Zieschang, INSEE

On the stochastic approach to index numbers
W. Erwin Diewert, University of British Columbia

Appendix II

PROVISIONAL AGENDA FOR A CONFERENCE ON CAPITAL STOCK TO BE HELD IN CANBERRA, 10-14 MARCH 1997

1. Review of country practices in estimation of capital stock:

   (a) What is the basis of valuation of the capital stock estimates (market prices, replacement cost, some combination, other)?

   (b) Asset types for which capital stock estimates are derived;

   (c) Type of volume indices at present (fixed base or chain Laspeyres, Fisher);

   (d) Methods used to determine capital stock: perpetual inventory method or some other method;

   (e) If perpetual inventory method used:

      (i) Data sources for values and price indices;

      (ii) Types of price indices used (Laspeyres, Paasche, Fisher? Fixed base year or chain?)

      (iii) Do the price indices relate to the assets themselves or to the inputs used in their production? Or a combination?

      (iv) How are asset lives determined (fixed or variable)?

      (v) Type(s) of depreciation function;

      (vi) Type(s) of survival function;

   (f) If methods other than the perpetual inventory method used:

      (i) What is the approach?

      (ii) What changes (if any) are planned (e.g., expansion of asset classification to accommodate the 1993 SNA, adoption of chain volume indices)?

   (g) Are alternative estimates compiled for different applications (i.e., balance sheets and productivity analysis)?

   (h) What are the major weaknesses in the estimates: any solutions?

   (i) What are the major challenges facing national statistical agencies in compiling capital stock estimates?

2. Concepts of capital for differing purposes (balance sheets, productivity analysis etc.).

3. Perpetual inventory method, practice and problems:

   (a) Estimating parameters of:

      (i) Mean asset lives;

      (ii) Alternative survival functions (simultaneous exit, Winfrey curves, delayed linear etc.);

      (iii) Alternative depreciation functions;

   (b) Construction of deflators;

   (c) Data sources for capital expenditure;

   (d) Dealing with sales of assets between sectors (e.g., privatization).

4. Alternative approaches:

   (a) Direct survey techniques: what can be learned from countries that have tried this approach?

   (b) Possible alternative measurement techniques;

   (c) Problems with these alternatives.

5. Experience with multi-factor productivity:

   (a) Country practice in the derivation of capital stock estimates for productivity analysis;

   (b) Problems with approach and results.

6. Balance sheets:

   (a) Other changes in volume account. How are valuation and other volume changes being identified?

   (b) Data sources and needs;

   (c) Presentation.

7. New measures of capital: problems with concepts, data and new data sources for:

   (a) Valuables;

   (b) Computer software;

(c) Non-weapon military equipment;

(d) Mineral exploration;

(e) Intangibles.

8. International comparability and cooperation:

(a) How to determine international comparability?

(b) Yardsticks for progress;

(c) Sharing of research load.

9. Any other issues.

10. Conclusion:

(a) Future work;

(b) Organization and terms of reference for future work, if any;

(c) Conference report.